SECTION C Descriptions and Specifications

SPECIFICATION FOR ENGINEERING AND TECHNICAL SUPPORT SERVICES

1.0 Introduction:

Carderock Division, Naval Surface Warfare Center, (NSWCCD) is responsible for theoretical and applied research efforts to enhance the structural and acoustic posture of U.S. Navy ships. Research, Development and fleet support efforts are conducted in such areas as materials design and testing, new ship/system designs, measurement and analysis of structural data, vibration analysis, radiated and structureborne noise improvements, and shock analysis and testing.

The contractor shall perform task assignments within the general scope of work described in the following paragraphs. The scope of work will include the conduct of stealth technology development, ship design application, and other analyses in support of the USS VIRGINIA (SSN774) and follow-on submarine programs, advanced signature reduction technology development and related Navy programs. The principal focus will be on submarine acoustic stealth R&D support involving full consideration of the unique cost-reduction, special mission, design philosophy, and other major issues of submarine programs. Technology developments are being accomplished in three major areas: hydroacoustic signatures; target strength (TS) signatures; and propulsor signatures. The objective of the R&D is development and effective application of advanced technology to achieve submarine acquisition cost containment, operational performance, and other program goals. The contractor shall evaluate advanced technologies, define and assess specific technology initiatives and approaches, and provide implementation-support documentation to realize technology potentials.

2.0 Scope:

The contractor shall provide technical support within the scope of the following task areas. Task deliverables will consist of documentation, data and materials in accordance with the task statement and the Contract Data Requirements List (Form DD 1423) of the base contract.

2.1 Task Area A Hydroacoustic Signatures:

The following efforts will be accomplished:

2.1.1 Review potential submarine radiated, platform, and sonar self-noise signature reduction technologies; Review and evaluate submarine hydroacoustic technology transition alternatives; Conduct technology maturity, risk, practicality, transition feasibility and related assessments and develop recommendations. Develop and document technical and programmatic approaches for submarine hydroacoustic signature reduction technology development and exploitation. Prepare plan of action and milestones (POA&M) and program planning support documentation.

2.1.2 Review submarine hydroacoustic signature reduction technology ship design applications, tradeoffs and ship impacts. Conduct design concept maturity, risk and related assessments. Prepare and document design concept development recommendations. Prepare design component development plans, and R&D planning documentation.

2.1.3 Review and analyze submarine program hydroacoustic performance goals. Define and document technical objectives to support performance goal achievement. Identify and organize multi-disciplinary technical efforts to accomplish the necessary R&D products. Analyze ship design milestones and define design input needs. Conduct schedule, cost, risk and related technical assessments of the major elements impacting R&D success. Develop documentation which identifies and documents controlling interactions among participating elements. Develop integrated multi-organization hydroacoustic R&D program documentation.

2.1.4 Review and evaluate submarine hydroacoustic signature R&D program technical developments and progress. Conduct schedule, cost, risk and technical assessments. Develop and document technical and programmatic recommendations to support achievement of program goals. Develop program progress reports and management support documentation.

2.1.5 Analyze submarine hydroacoustic signature reduction program technical, performance, cost, schedule and ship design support issues. Develop analysis assessments and documentation. Develop submarine signature R&D and ship design program support documentation including POA&Ms, memoranda of agreement/understanding (MOA/MOU), Test and Evaluation (T&E) plans and program technical, schedule and financial reports.

2.1.6 Revie w potential submarine hydroacoustic signature reduction ship design support computational tool technology applications. Conduct technology maturity, risk, transition feasibility and related assessments. Develop and document integrated approaches for computational tool development and validation. Prepare POA&M, MOA/MOU, program plan and model validation plans.

2.2 Task Area B Target Strength Signatures:

The following efforts will be accomplished:

2.2.1 Review and evaluate potential submarine target strength signature reduction technologies; Review and evaluate submarine target strength technology transition alternatives; Conduct technology maturity, risk, practicality, transition feasibility and related assessments and develop recommendations. Develop and document technical and programmatic approaches for submarine target strength signature reduction technology development and exploitation. Prepare plan of action and milestones and program planning support documentation.

2.2.2 Review submarine target strength signature reduction technology ship design applications, tradeoffs and ship impacts. Conduct design concept maturity, risk and related assessments. Prepare and document design concept development recommendations. Prepare design component development plans, and R&D planning documentation.

2.2.3 Review and analyze submarine program target strength performance goals. Define and document technical objectives to support performance goal achievement. Identify and organize multi-disciplinary technical efforts to accomplish the necessary R&D products. Analyze ship design milestones and define design input needs. Conduct schedule, cost, risk and related technical assessments of the major elements impacting R&D success. Develop documentation which identifies and documents controlling interactions among participating elements. Develop integrated multi-organization target strength R&D program technical plans and program management support documentation.

2.2.4 Review and evaluate submarine target strength signature R&D program technical developments and progress. Conduct schedule, cost, risk and technical assessments. Develop and document technical and

programmatic recommendations to support achievement of program goals. Develop program progress reports and management support documentation.

2.2.5 Analyze submarine target strength signature reduction program technical, performance, cost, schedule and ship design support issues. Develop analysis assessments and documentation. Develop submarine target strength signature R&D and ship design program support documentation including POA&Ms, memoranda of agreement/understanding (MOA/MOU), Test and Evaluation (T&E) plans and program technical, schedule and financial reports.

2.2.6 Conduct technical and performance analyses covering target strength signature sources, performance impact, signature mitigation mechanisms and ship impact.

2.3 Task Area C Propulsor Signatures:

The following efforts will be accomplished:

2.3.1 Review and analyze submarine program propulsor acoustic performance goals. Define and document technical objectives to support performance goal achievement. Identify, organize and document multidisciplinary technical efforts to accomplish the necessary R&D products. Conduct schedule, cost, risk and related technical assessments of the major elements impacting R&D success. Identify and document controlling interactions among participating elements. Develop integrated propulsor acoustic R&D program technical plans. Prepare plan of action and milestones (POA&M) and program planning support documentation.

2.3.2 Review and evaluate submarine propulsor acoustic signature R&D program technical developments and progress. Conduct schedule, cost, risk and technical assessments. Develop and document technical and programmatic recommendations to support achievement of program goals. Develop program progress reports and management support documentation.

2.3.3 Analyze submarine propulsor acoustic signature reduction program technical, performance, cost, schedule and ship design support issues. Develop analysis assessments and documentation. Develop submarine signature R&D and ship design program support documentation including POA&Ms, memoranda of agreement/understanding (MOA/MOU), Test and Evaluation (T&E) plans and program technical, schedule and financial reports.

2.3.4 Compile, organize and document submarine propulsor acoustic design guidance support information. Develop and recommend documentation formats for translating design guidance information into parameters that can be utilized in propulsor hydrodynamic and structural design. Develop and document propulsor acoustic design guidance documentation.

2.3.5 Review potential submarine propulsor acoustic signature reduction ship design support computational tool technology applications. Conduct technology maturity, risk, transition feasibility and related assessments. Develop and document integrated approaches for computational tool development and validation.

2.3.6 Design, demonstrate and document computational tool technology to support integrated acoustic computational models and related computational model developments.

2.3.7 Conduct test planning evaluate and document test results for open and compound propulsors.

2.4 Task Area D ISMS:

The following efforts will be accomplished:

2.4.1 Identify, organize and document multi-disciplinary technical efforts to accomplish the necessary INTERMEDIATE SCALE MEASUREMENT PROGRAM/SYSTEM (ISMP/S) R&D products. Conduct schedule, cost, risk and related technical assessments of the major elements impacting R&D success. Identify and document controlling interactions among participating elements and provide recommendations for achieving R&D program and ISMP program goals. Prepare ISISMP progress reports and management support documentation.

2.4.2 Review and evaluate ISMS technical requirements for supporting facility user R&D programs. Develop and document ISMS hardware, software and related recommendations to support achievement of R&D USER GOALS. Develop, document and demonstrate procedures for ISMS components necessary to accomplish test objectives.

2.4.3 Perform engineering and data analyses in support of ISMS experiment and test activities. Develop, demonstrate and document signal and data processing algorithms for use in the ISMS relating to planar waveforms, frequency coverage, calibrations, transmitted acoustic fields and other system operating characteristics. Participate in ISMS system configuration reviews and provide recommendations for system performance improvement and operating cost reduction.

2.4.4 Review potential ISMS user support applications and define and document specific efforts that could be accomplished for particular users. Define, assess and document ISMS and related facility modifications/upgrades to support new users and exploit ISMS capabilities.

2.5 Task Area E Signature Programs:

The following efforts will be accomplished in support of advanced submarine/ship/naval vehicle development, signature technology development and related programs:

2.5.1 Support definition and establishment of ship signature R&D projects. Review potential acoustic and non-acoustic signature reduction technologies. Conduct technology maturity, risk, practicality, transition feasibility and related assessments. Develop and document technical approaches for signature reduction technology development and exploitation. Perform analyses and document development and utilization of test facilities to support RDT&E. Develop POA&M, MOA/MOU, program plan, progress report, test plan, RDT&E, special issue report and program management support documentation. Accomplish ship sensor interface and performance assessments. Perform and document the results of ship signature issue analyses. Conduct special technical analyses and evaluations including planning, data acquisitions, and documentation.

3.0 Documentation:

3.1 Monthly Progress Reports:

Monthly progress reports shall be submitted to the COR describing by Delivery Order Tasking efforts performed, deliverables provided, and funds expended in the previous month.

3.2 Other Documentation:

Other documentation, as described in the Contract Data Requirements List (CDRL) shall be submitted as required by Delivery Order Tasks. This includes documentation of the following types: technical reports, test plans, schedules, analyses documentation, POA&M, MOA or MOU, program plans, project progress reports, letter reports, and copies of viewgraph presentations.